

WHAT IS CLAIMED IS:

1 1. A method for communicating information to a remotely located
2 computer, the method comprising:
3 encoding the information using a plurality of features of an optical
4 pointer;
5 transmitting the encoded information to a remote location using the
6 optical pointer;
7 detecting the plurality of features of the optical pointer;
8 decoding the information based on the detected plurality of features
9 of the optical pointer; and
10 generating a command for the remotely located computer based on
11 the decoded information.

1 2. The method of claim 1 wherein the step of detecting comprises:
2 capturing at least one image of the optical pointer using a camera;
3 and
4 processing the at least one image to identify the plurality of
5 features of the optical pointer.

1 3. The method of claim 2 wherein the step of processing the at
2 least one image comprises:
3 processing a plurality of frames by comparing an image to a
4 previously captured image to detect differences between the image and the
5 previously captured image.

1 4. The method of claim 1 wherein the step of generating a
2 command comprises generating a command to move a computer cursor to a
3 position corresponding to position of a cursor transmitted by the optical pointer.

1 5. The method of claim 1 wherein the step of transmitting the
2 encoded information comprises transmitting the encoded information to a
3 remotely located surface for detection by a camera.

1 6. The method of claim 1 wherein the step of transmitting the
2 encoded information comprises transmitting the encoded information to a
3 remotely located receiver.

1 7. The method of claim 1 wherein the plurality of features of the
2 optical pointer include at least one emitter capable of generating light within at
3 least a portion of at least one area.

1 8. The method of claim 1 wherein the plurality of features of the
2 optical pointer comprise a plurality of sections, each section having at least one
3 area of light, the area being generated by a portion of an emitter, a dedicated
4 emitter, or a cluster of emitters acting together.

1 9. The method of claim 8 further comprising transmitting a
2 plurality of channels of information with each channel of information being
3 transmitted via a corresponding section.

1 10. The method of claim 9 wherein at least one of the plurality of
2 channels of information includes voice data.

3 11. The method of claim 9 wherein at least one of the plurality of
4 channels of information includes keyboard character information.

1 12. The method of claim 8 wherein the at least one area of light
2 has a plurality of associated attributes.

1 13. The method of claim 12 further comprising:
2 changing at least one attribute in a predetermined manner to
3 uniquely identify the optical pointer.

1 14. The method of claim 12 wherein the plurality of associated
2 attributes include characteristics that can be modified in a time-dependent pattern
3 to distinguish a given area over time among multiple image frames.

1 15. The method of claim 14 wherein the plurality of attributes
2 includes at least one of shape, intensity, orientation, and wavelength.

1 16. The method of claim 1 wherein the information includes
2 identification information to uniquely identify a user.

1 17. The method of claim 16 wherein the step of generating a
2 command comprises generating a command to allow a user access based on the
3 identification information.

4 18. A method for remotely controlling a computer, the method
5 comprising:
6 displaying output from the computer on a remotely located screen;
7 encoding keyboard information by modulating one or more optical
8 pointer features;
9 projecting the encoded keyboard information on the remotely
10 located screen;
11 capturing a plurality of image frames including at least a portion of
12 the remotely located screen;
13 processing image frames to detect and decode the encoded
14 keyboard information transmitted by the optical pointer; and
15 generating a command to control the computer based on the
16 decoded information.

1 19. The method of claim 18 further comprising:
2 encoding voice information by modulating one or more optical
3 pointer features.

1 20. The method of claim 18 wherein the step of processing
2 comprises detecting a change in orientation of the optical pointer.

1 21. The method of claim 18 wherein the step of processing
2 comprises detecting a pattern of movement, a change in orientation, or a change
3 in size of the optical pointer, and wherein the step of generating a command
4 comprises generating a sequence of commands.

1 22. The method of claim 18 wherein the step of processing
2 comprises detecting a pattern of movement of the optical pointer.

1 23. The method of claim 22 wherein detecting a pattern of
2 movement comprises detecting a change in size of an optical pointer feature.

1 24. The method of claim 23 wherein detecting a pattern of
2 movement comprises detecting an increased size of an optical pointer feature and
3 wherein the step of generating a command comprises generating a zoom command
4 for the computer.

5 25. The method of claim 22 wherein the step of generating
6 comprises generating a scroll command for the computer.

1 26. A computer presentation system comprising:
2 a computer;
3 a screen associated with the computer for displaying output from
4 the computer;
5 a camera positioned to capture a plurality of image frames
6 including at least a portion of the screen associated with the computer, the camera
7 being in communication with the computer;
8 wherein the computer includes instructions for processing the
9 image frames to detect modulation of at least one feature of an optical cursor
10 projected onto the screen from an external optical pointer and instructions for

11 decoding the modulated feature to generate a corresponding input for the
12 computer.

1 27. The system of claim 26 further comprising:
2 a projector in communication with the computer for projecting an
3 image of the output from the computer onto the screen.

1 28. The system of claim 26 further comprising a laser pointer for
2 generating the optical cursor.

1 29. The system of claim 26 wherein the computer includes
2 instructions for processing the image frames to detect a predetermined pseudo-
3 random modulation of the at least one feature to uniquely identify the external
4 optical pointer.

5 30. The system of claim 26 wherein the computer includes
6 instructions for processing the image frames to detect a pattern of movement and
7 to decode the pattern of movement to generate a zoom command input.

1 31. The system of claim 26 wherein the computer includes
2 instructions for processing the image frames to detect a change in size of one or
3 more features of the optical pointer and to decode the change in size to generate a
4 zoom command input.

1 32. The system of claim 26 wherein the computer includes
2 instructions for processing the image frames to detect a pattern of movement and
3 to decode the pattern of movement to generate a rotation command input.

1 33. The system of claim 26 wherein the at least one feature
2 comprises shape, wavelength, intensity, or orientation.